Rapid Access to Information During a Harmful Algal Bloom Event

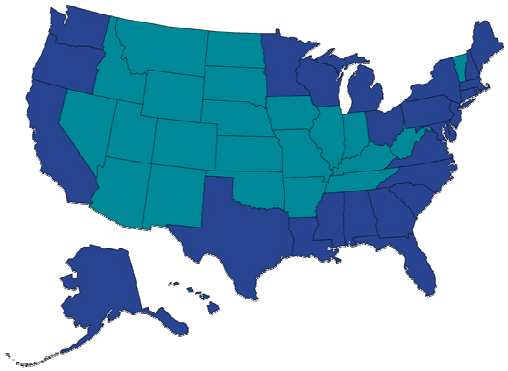
Mary Culver

NOAA Coastal Services Center

Binational Workshop

June 2003

NOAA Coastal Services Center



Linking People, Information, and Technology

Primary Constituents

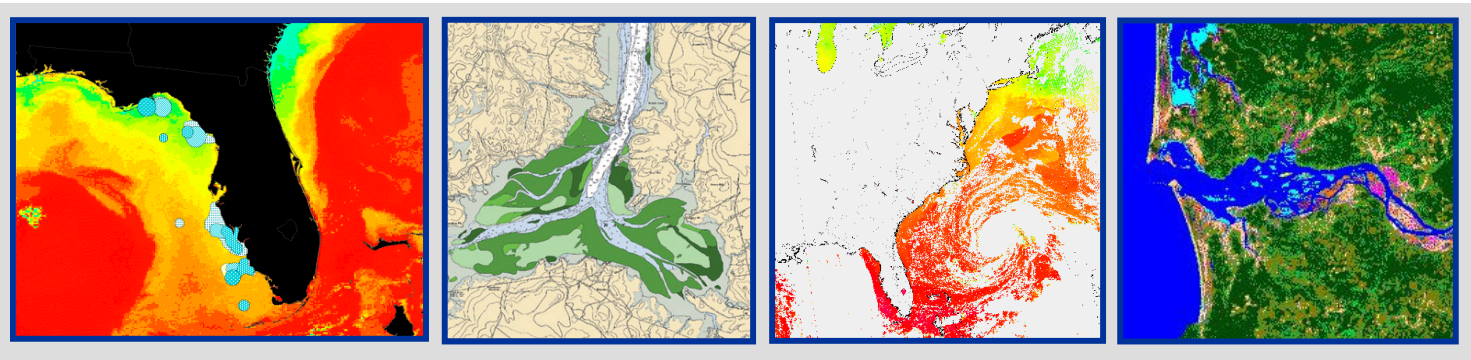
State and Local Resource Managers

- Protected areas
- Regulatory agencies
- Wildlife agencies
- Planners
- Scientists
- State Sea Grants
- Emergency preparedness

Coastal Remote Sensing Program

Linking coastal resource managers with relevant remote sensing technologies through

- Data acquisition/access
- Tool and product development, training, and outreach
- Applied research and applications development
- Effective partnerships



The Problem

Harmful Algal Blooms can cause:

- Fish, bird, and marine mammal distress and mortality
- Public health problems
- Economic losses


Charlotte Sun-Herald

A Solution

HAB Decision Support Systems

- Improve Monitoring and Communication
- Forecast Events
  - transport of existing HAB
  - conditions favorable for HAB

Characteristics of the Ideal Decision Support System

- Provides information - analyzed data with interpretation
- Contains visual and text components
- Timely and routinely updated
- Reliable and easily accessible on the Internet
- Accurate
- Regional perspective for local interpretation

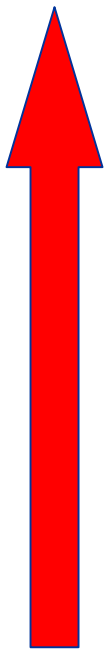
From HABSOS, 2000 workshop

Need for Timely Information

Primary users of information

- Fisheries managers
- Public health officials
- Research community
- Local government

Warning Time	Management Options
seasonal	re-allocate resources alter monitoring schedules change harvesting policy
week – 3 days	alter monitoring schedules change harvesting policy alert businesses prepare for clean-up
24 hours	alter monitoring schedules alert businesses prepare for clean-up
none	extensive testing of harvested products initiate public health warnings divert resources to monitoring and clean-up



HAB Decision Support Systems

Focus on Near Real-Time Data

- Provide a Notification of Change in Conditions
  - **Harmful Algal Bloom Bulletin**
- Provide a Continuous Supply of Information
  - **HAB Mapping System (HABMapS)**
- Support the Larger HABSOS effort

Harmful Algal Bloom Bulletins

Brief History

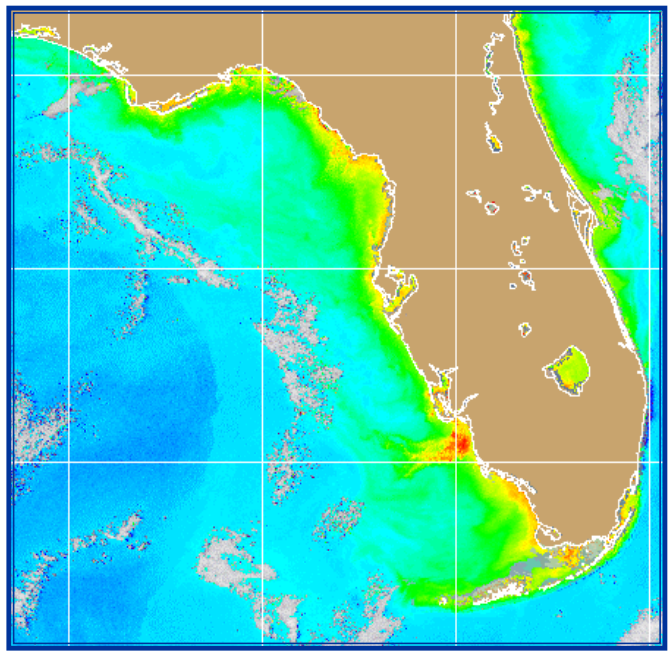
1999: Coordinated monitoring with Florida

2000: Coordination started with Texas, Louisiana, Mississippi, and Alabama
PDF format introduced

2001: New analyses introduced

2002: Improve Texas analysis
Incorporate new models

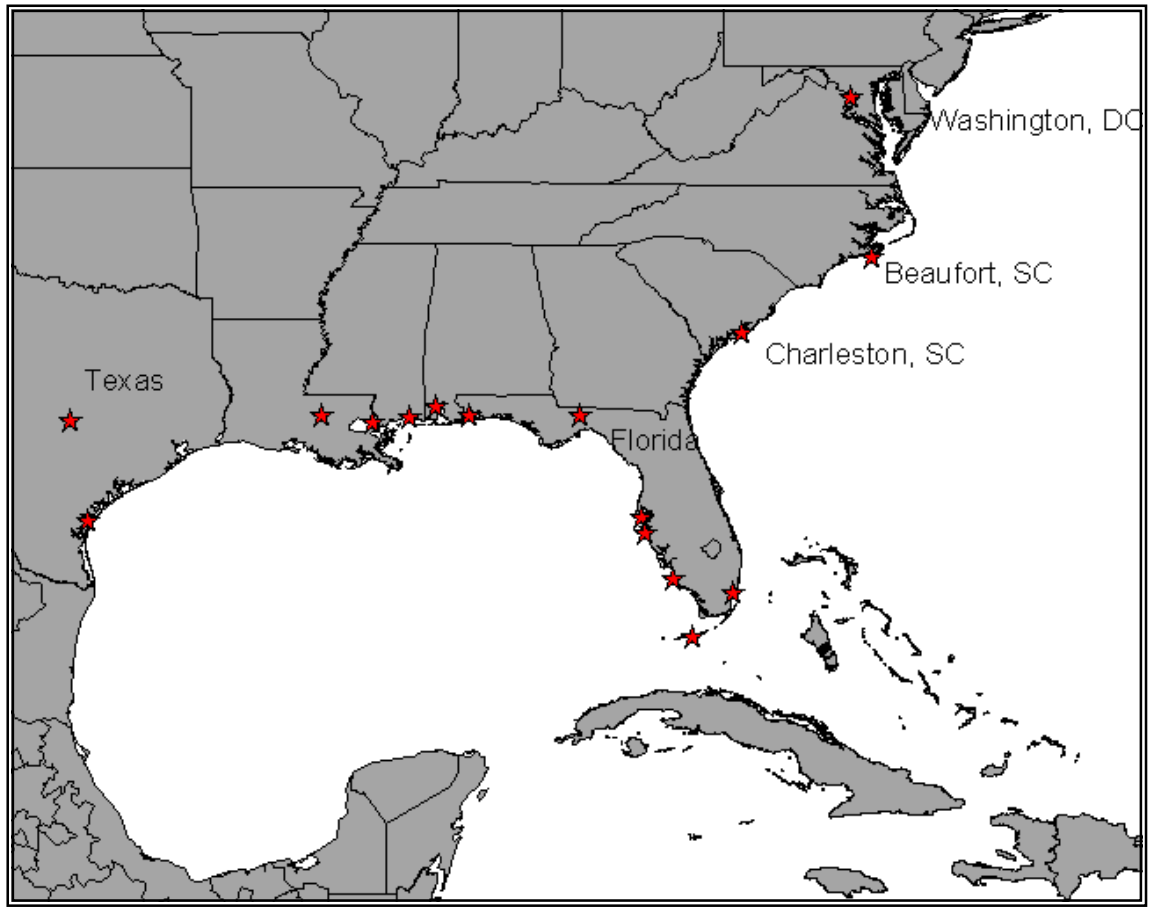
2003: Adding other detection models;
Beginning transition to “operational”



Harmful Algal Bloom Bulletins

Subscribers

- County Government
- State Government
- Federal Government
- Non-governmental organizations
- Academic Institutions



Harmful Algal Bloom Bulletin

- Notice of changing conditions
- Available within e-mail to coastal managers

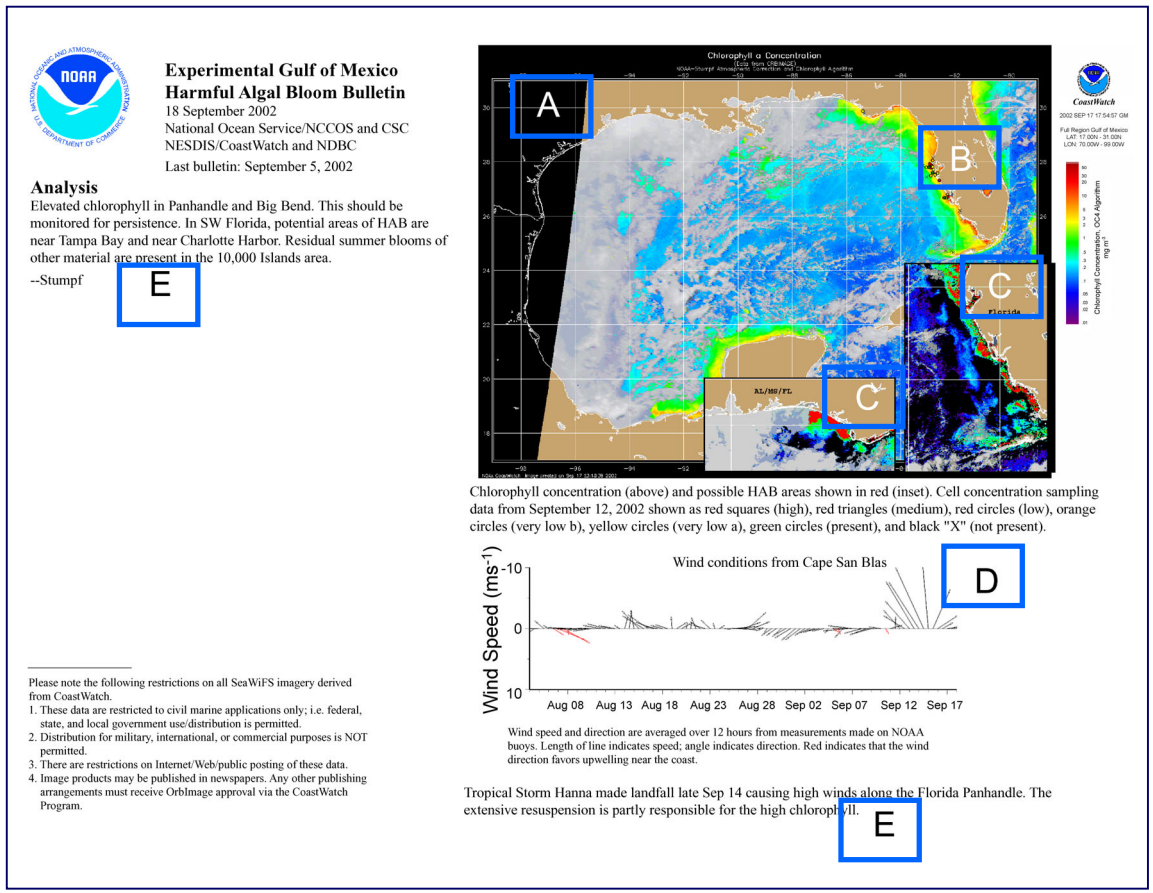
A – SeaWiFS chlorophyll image

B – Last known position

C – Areas affected

D – Local winds

E – Data interpretation



Experimental Gulf of Mexico Harmful Algal Bloom Bulletin
18 September 2002
National Ocean Service/NCCOS and CSC
NESDIS/CoastWatch and NDBC
Last bulletin: September 5, 2002

Analysis
Elevated chlorophyll in Panhandle and Big Bend. This should be monitored for persistence. In SW Florida, potential areas of HAB are near Tampa Bay and near Charlotte Harbor. Residual summer blooms of other material are present in the 10,000 Islands area.

--Stumpf

E

Please note the following restrictions on all SeaWiFS imagery derived from CoastWatch.
1. These data are restricted to civil marine applications only; i.e. federal, state, and local government use/distribution is permitted.
2. Distribution for military, international, or commercial purposes is NOT permitted.
3. There are restrictions on Internet/Web/public posting of these data.
4. Image products may be published in newspapers. Any other publishing arrangements must receive OrbImage approval via the CoastWatch Program.

Chlorophyll concentration (above) and possible HAB areas shown in red (inset). Cell concentration sampling data from September 12, 2002 shown as red squares (high), red triangles (medium), red circles (low), orange circles (very low b), yellow circles (very low a), green circles (present), and black "X" (not present).

Wind speed and direction are averaged over 12 hours from measurements made on NOAA buoys. Length of line indicates speed; angle indicates direction. Red indicates that the wind direction favors upwelling near the coast.

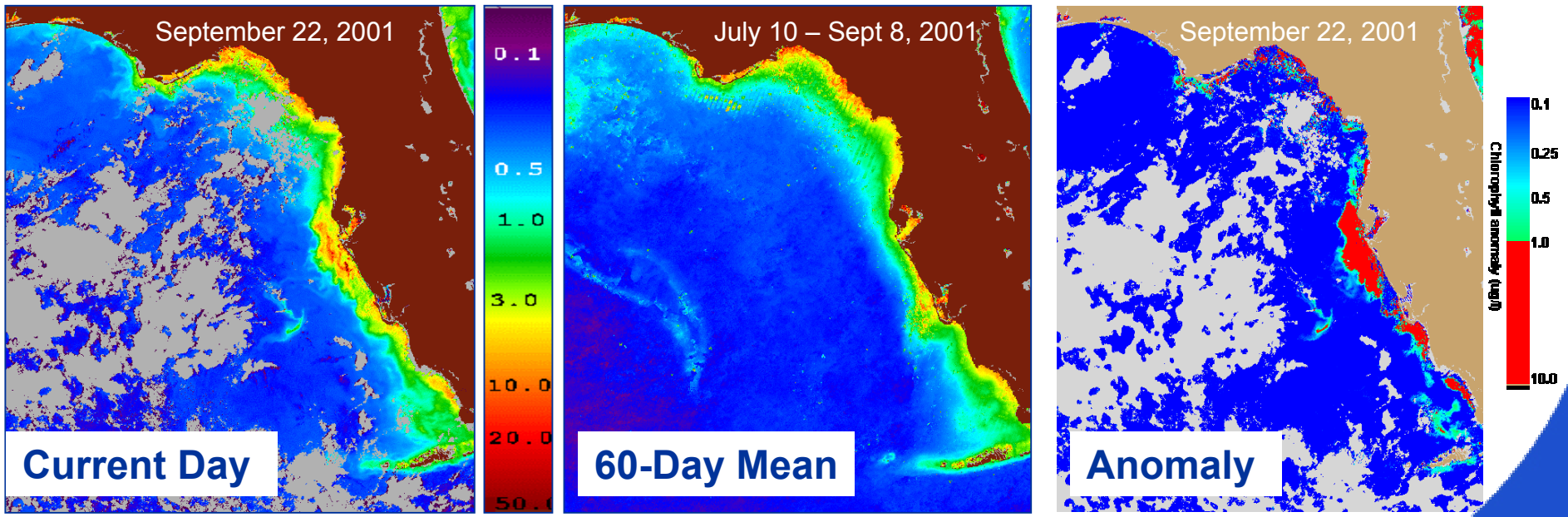
Tropical Storm Hanna made landfall late Sep 14 causing high winds along the Florida Panhandle. The extensive resuspension is partly responsible for the high chlorophyll.

E

NOAA Center for Coastal Ocean Science
NOAA CoastWatch
NOAA Coastal Services Center

Anomaly Method for Identifying Florida Blooms

- *K. brevis* dominates biomass in late summer
- Effective in turbid waters
- Compatible with optical algorithms
- Accuracy > 80% during summer and fall

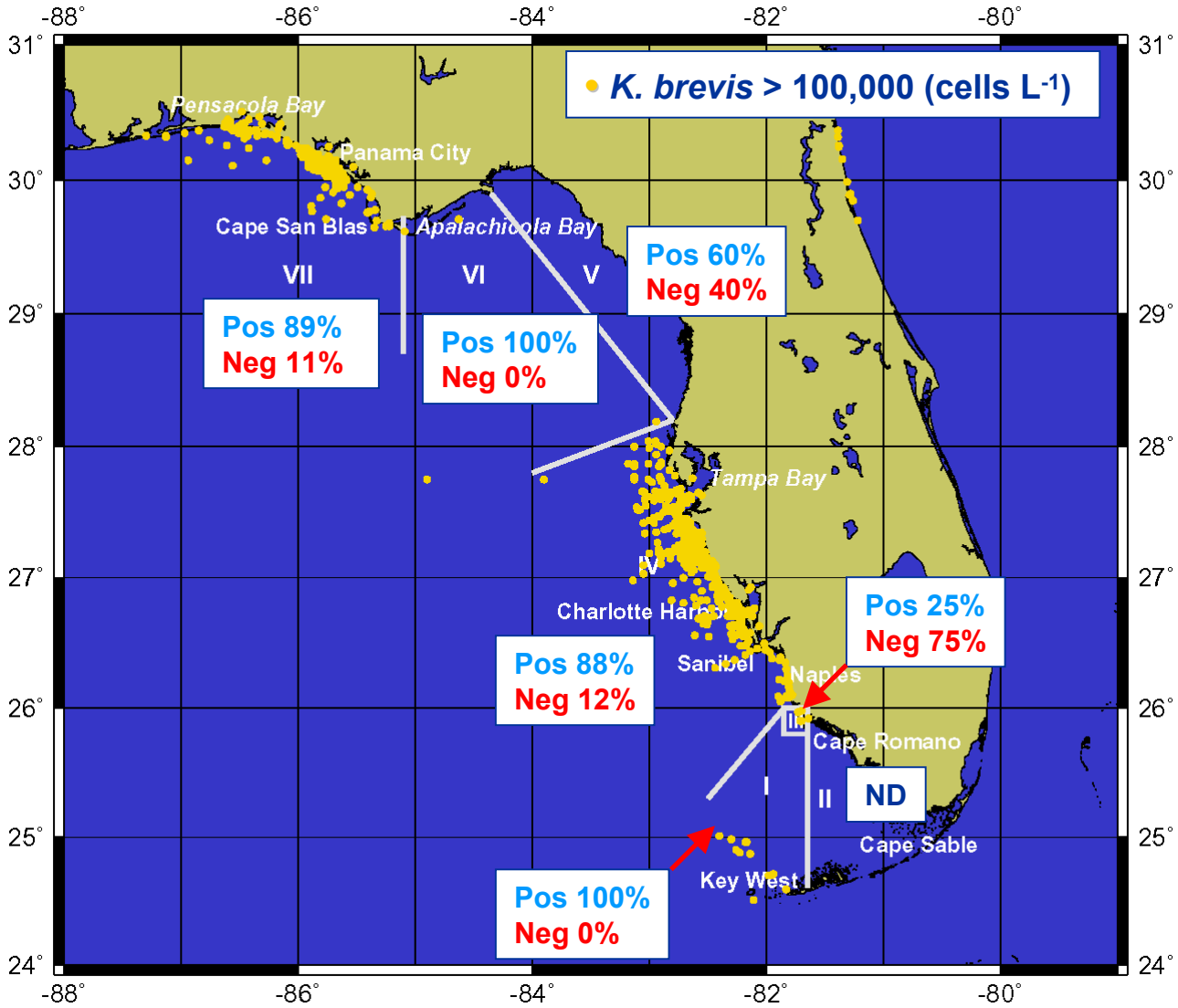


Stumpf, 2001

NOAA

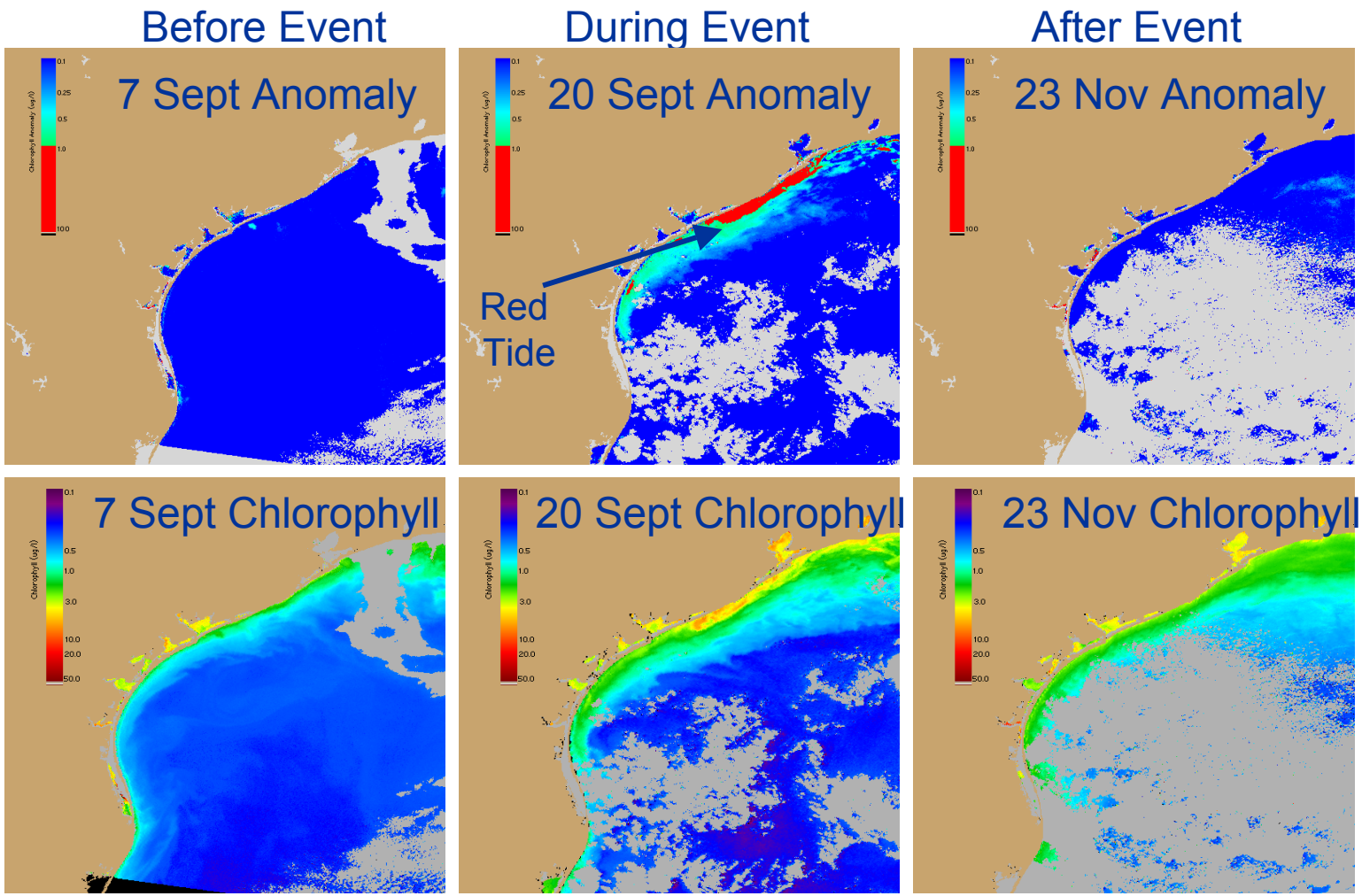
Detection Results

- Effective in regions I, IV, VI, VII
- Few false negatives
- False positives March-July and in region V



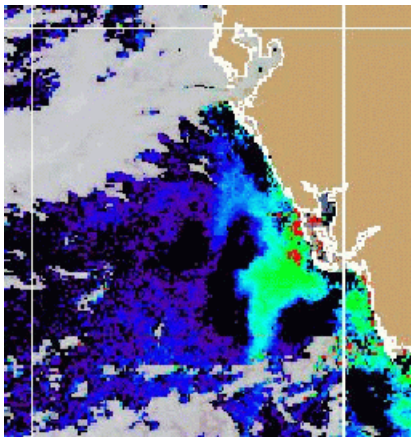
Tomlinson et al. submitted

Improved Anomaly Being Tested in Texas

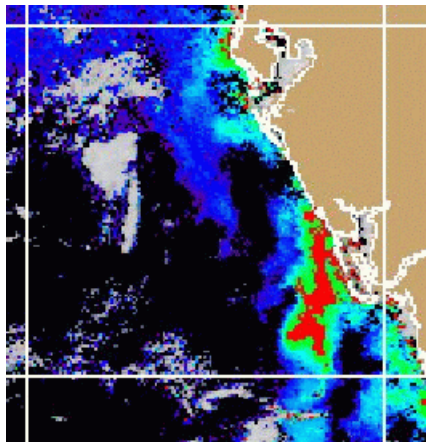


Villareal and Stumpf MERHAB project

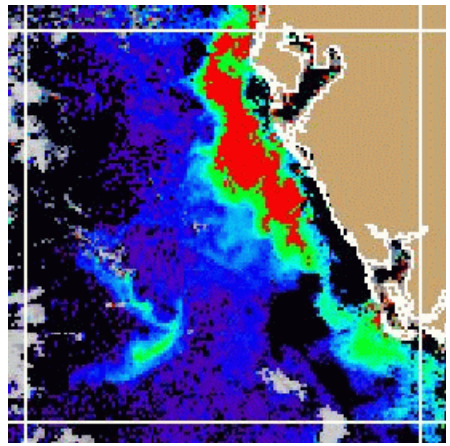
Integrated Data for Forecasting



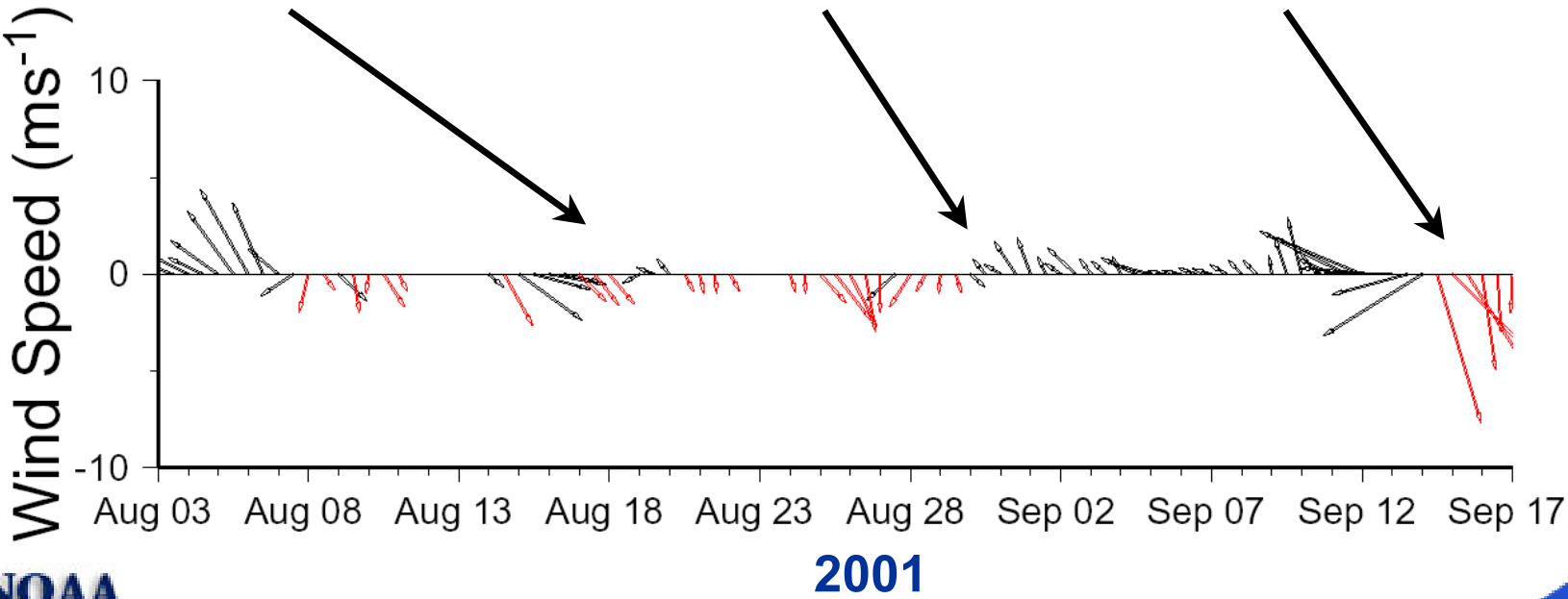
August 20



August 30



September 17



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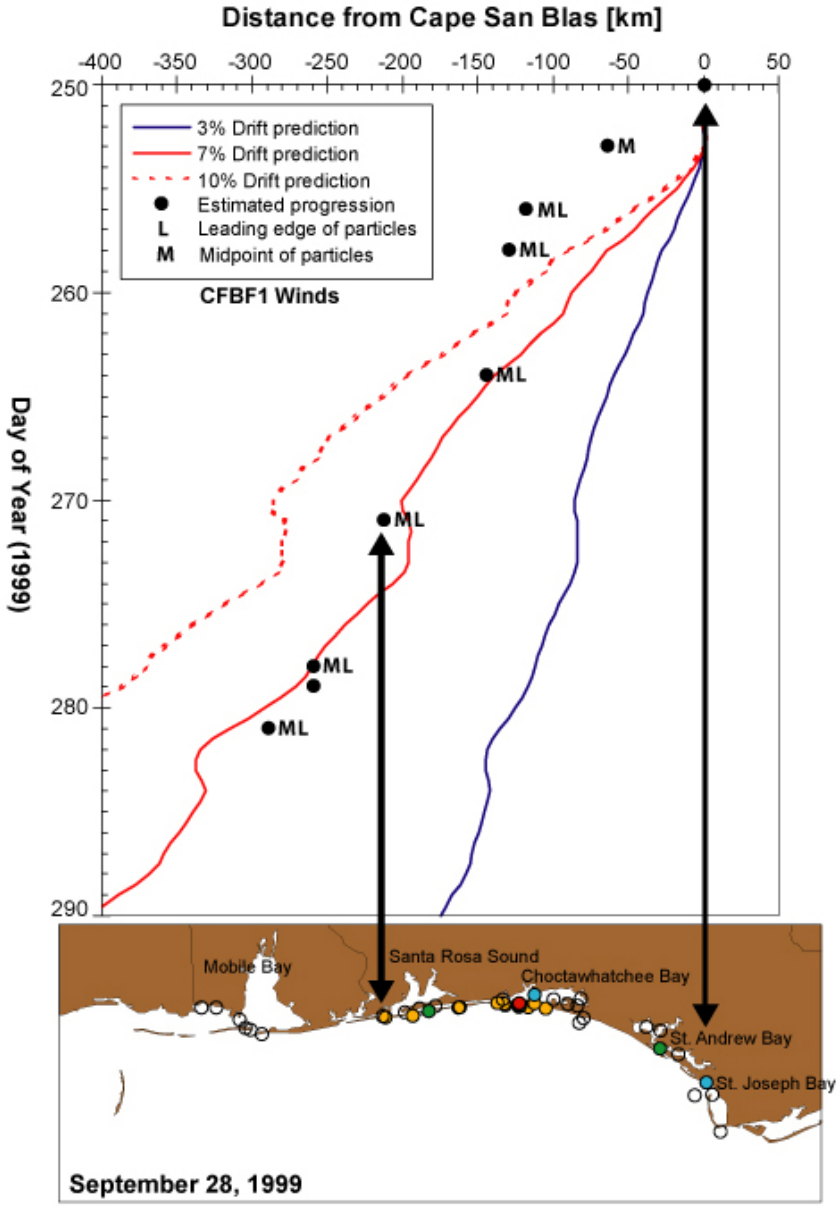
Forecasting Transport



Adapt oil-spill response models for use with *Karenia brevis*

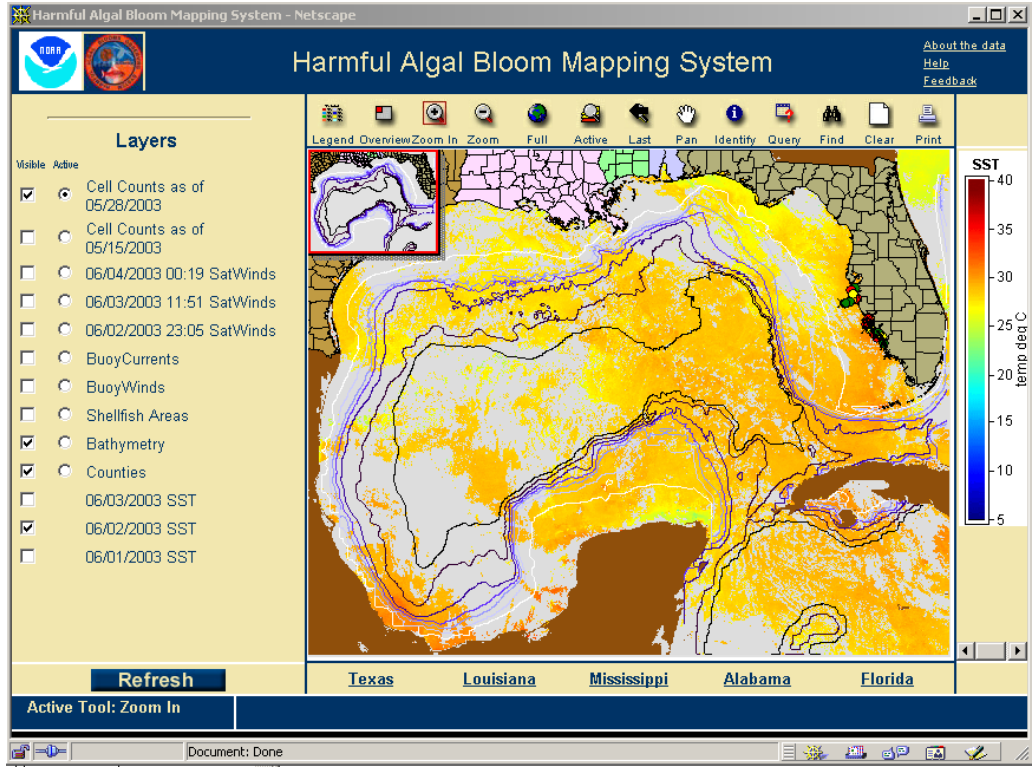
Implementation planned for next bloom season.

Culver, Watabayash, and Stumpf

NOAA

Real-Time Harmful Algal Bloom Mapping System

- Pilot for Real-time Data Access
- Visualization of available datasets
- Maps and data
- Available anytime on the Internet
- Data layers updated daily



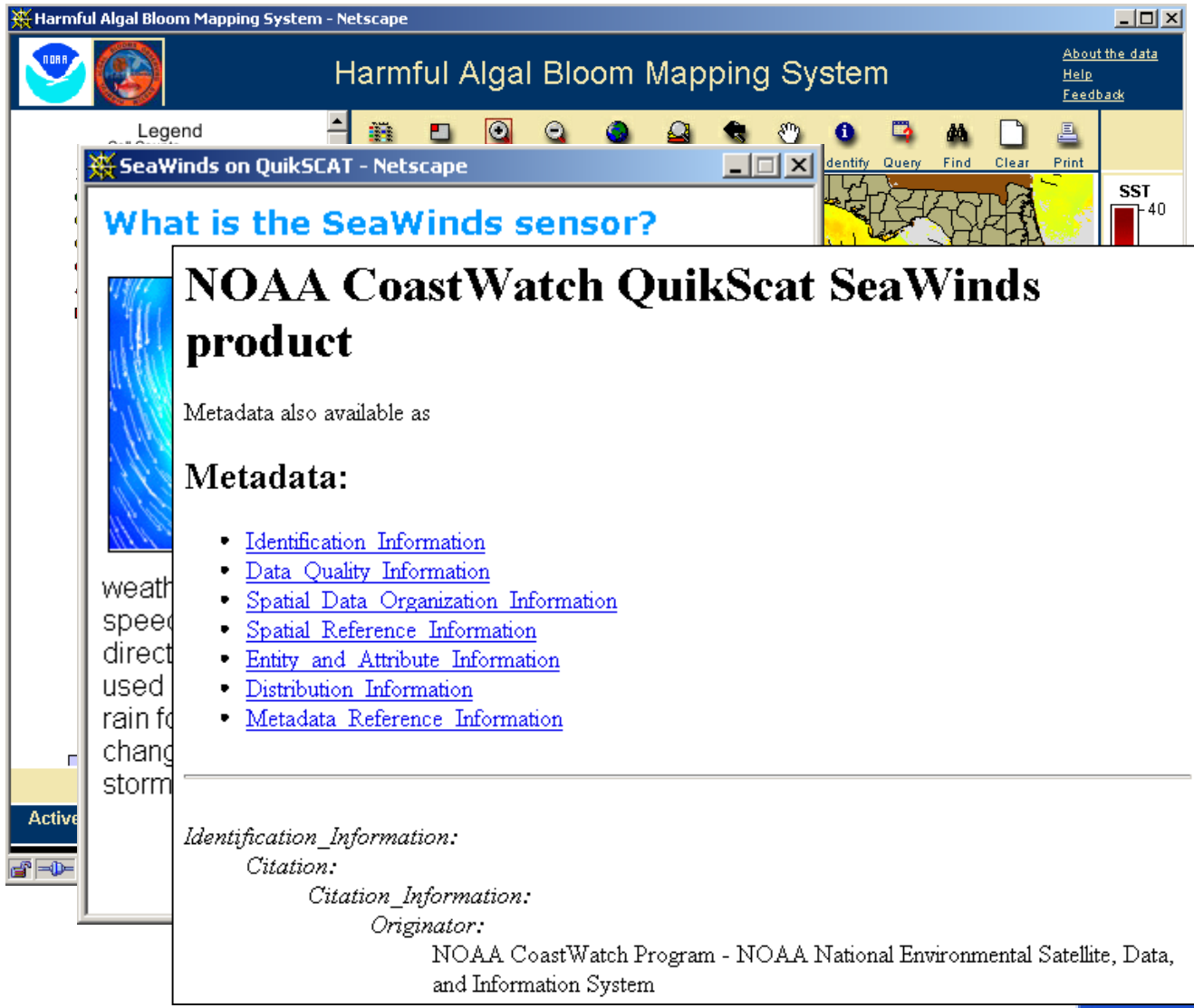
www.ncddc.noaa.gov/habsos/Mapping/RealTime

www.csc.noaa.gov/crs/habf/habmaps.html

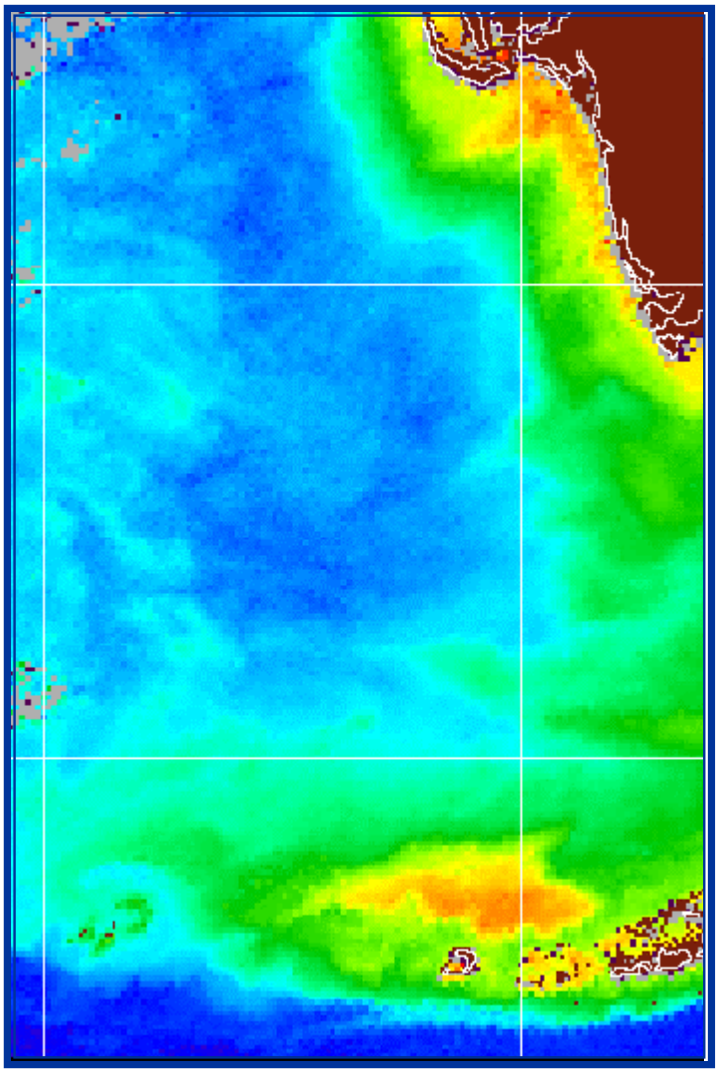
NOAA Coastal Services Center
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

Data and Information

- Data Layers
  - Definitions
  - Frequency
  - Resolution
  - Source
- Query Tools
- Download
  - Data
  - Metadata



Collaborators



- NOAA
  - National Center for Coastal Ocean Science
  - National Coastal Data Development Center
  - National Data Buoy Center
  - NWS Extended Marine Forecasts
  - CoastWatch
- Florida Marine Research Institute
- Mote Marine Lab
- Texas Parks and Wildlife
- University of Texas
- Louisiana, LUMCON
- Dauphin Island Sea Lab
- ORBIMAGE, Inc.
- HABSOS

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